The symptoms in untreated persons last for a week and convalesence takes a month or more. There is considerable loss of weight, one patient having lost 5 kg. in 3 days. In experimental animals there is an instance of a rat having lost 20% of its weight in 24 hours.

Curiously enough the effect of the venom on different animals varies and the relative size of the animal appears to be of no importance. The poison is deadly to camels and horses (a horse injected with the macerate of a single spider died within 24 hours) but has no effect on goats! Among the smaller animals mice are highly sensitive, death following a bite in 10 to 20 minutes. Rabbits and dogs are resistant. The venom has no effect on reptiles. It is especially effective on nerve cells, and is believed to have a toxic effect 15 times greater than that of the rattlesnake. The venom is of a clear lemon-yellow colour. The Ph changes with temperature, becoming alkaline above 25° C. and consequently more toxic. It is also established that the venom of different species is practically identical and anti-venom against the bite of one species gives equal protection against allied species. The method of treatment which gave the best results was simultaneous application of anti-venom and calcium; however, injection of calcium salts alone in the absence of anti-venom would be sufficient to give relief. An intravenous injection of calcium gluconate, chlorate, or bromate gives immediate and great relief from pain. The pain may recur but these relapses run a milder course. Several injections of calcium are recommended to complete the treatment.

The bite of most species of spiders causes no more harm than momentary discomfort.

BOMBAY NATURAL HISTORY SOCIETY,
91, WALKESHWAR ROAD,
BOMBAY 6,
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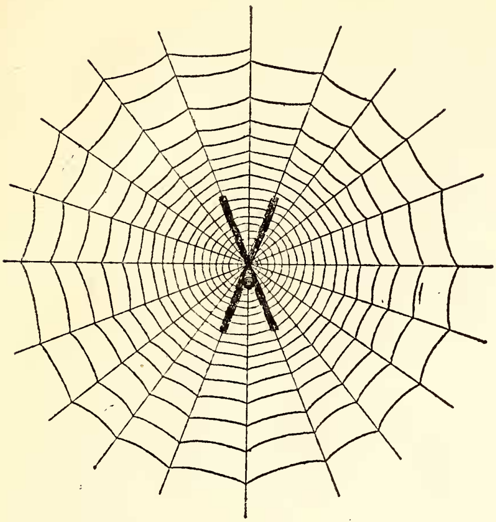
J. C. DANIEL
P. W. SOMAN

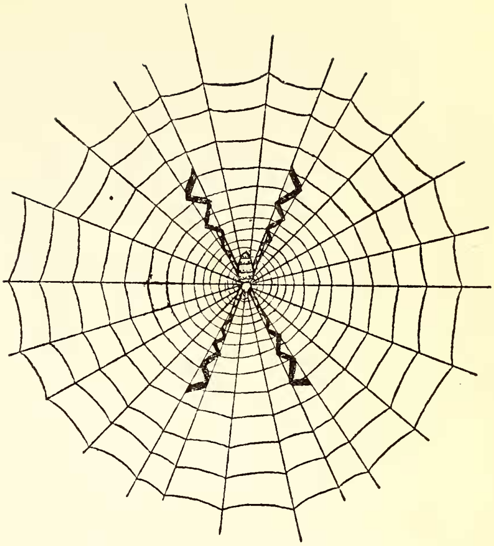
## 21. PROTECTIVE DEVICES OF SOME ORB-WEAVING SPIDERS FROM INDIA

(*With nine text-figures*)

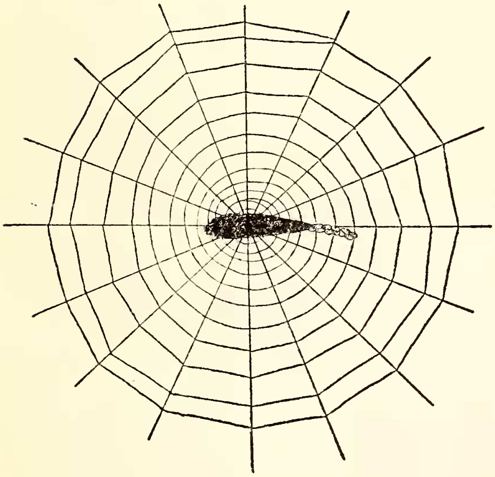
In the course of my field collections of spiders in India I have come across interesting examples of protective devices, mainly among the orb-weaving spiders. In this note I summarise some of my observations.



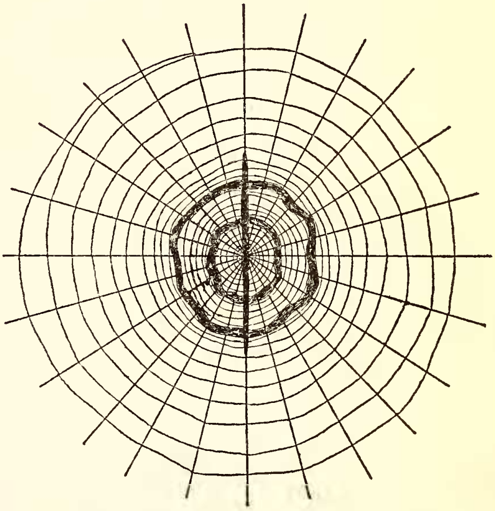
Text-fig. 1. Web of *Argiope arcuata*, with X-shaped protective band



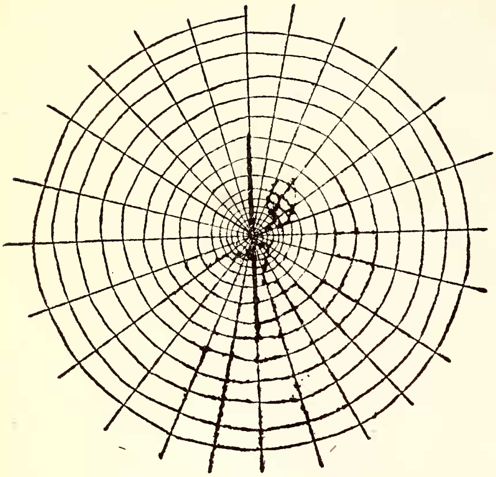
Text-fig. 2. Web of *Argiope pulchella*, with zigzag protective band



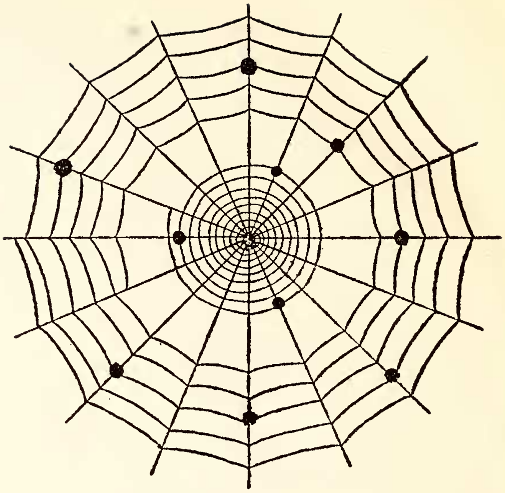
Text-fig. 3. Web of *Uloborus* sp. with broad protective band



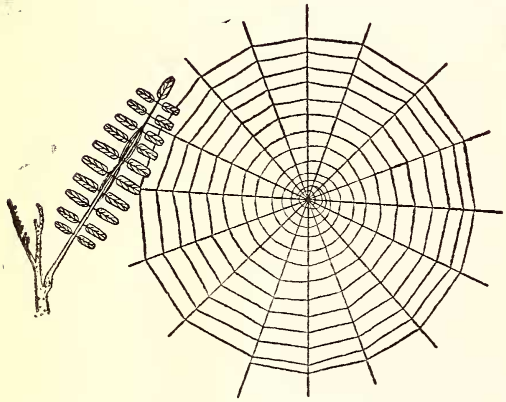
Text-fig. 4. Web of *Cyclosa* sp. with circular protective bands



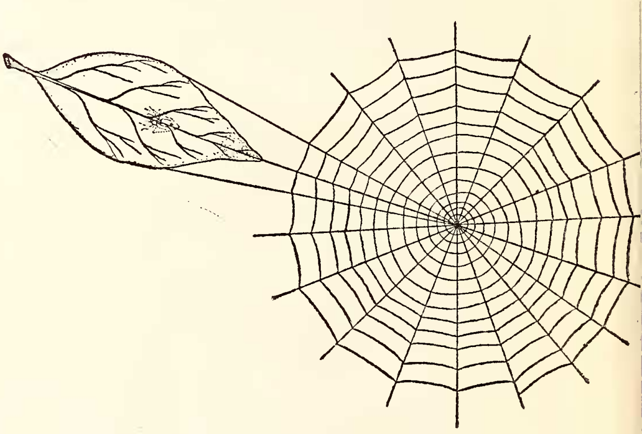
Text-fig. 5. Web of *Cyclosa* sp. with rod-like protective band



Text-fig. 6. Web of *Gasteracantha arcuata*, with protective masses of waste products



Text-fig. 7. Web of *Tetragnatha mandibulata*, with the spider sheltering in the leaf of a leguminous plant



Text-fig. 8. Web of *Araneus dehaanii*, with a leaf attached

At first sight it must seem rather strange that the customary position of a spider, in the middle of its web, is the one in which the creature is conspicuously exposed to every prey and enemy.

The spiders of the genus *Argiope* are true orb-weaving spiders and are very common all over India. All the known species are beautifully coloured on their abdomen. They construct a net web, often suspended between two adjoining branches of low-growing plants. It is a large orb-shaped construction with four characteristic white silken lines, making an 'X' in the centre. On these four white lines the spider places its four pairs of legs in such a manner that one is not able to see the spider from the other side. The spider hangs vertically, head downward. If anybody approaches the web from the front, the spider immediately goes to the other side and at the same time vibrates the entire web in such a way that one cannot see the spider. *Argiope arcuata* Simon makes the 'X' with wide ribbon-like bands (Text-fig. 1). *Argiope pulchella* Thorell does so with zigzag lines (Text-fig. 2).

Some species of *Uloborus* from western Sikkim occur on rock. It is very difficult to spot these spiders on their webs. They prepare their webs a few centimetres from the rock and at the centre of the web is a spreading band. The spider and the band are of the same colour. The spider hangs downward just behind the central band, and sometimes the egg mass also hangs along the band (Text-fig. 3). A *Cyclosa* sp. from Shillong illustrates an extension of this mode of concealment. It spins the central shield and round it adds rough irregular circles of silk ribbon. These circular ribbons have a protective value and the spider sits just behind the central ribbon (Text-fig. 4).

I have collected other species of *Cyclosa* from Sikkim. They prepare their web in the normal way but in the centre of the web they place vertically a rod-like band, in the middle of which there is a small gap of dimensions depending on the size of the spider (Text-fig. 5). When the spider rests in the gap, the band seems like a continuous straight line. Different species of *Cyclosa* may be of different colours, e.g. one is silvery white and another ash-coloured. The colour of the protective band corresponds to the body colour.

The spiders of the genus *Gasteracantha* have large abdomens and are beautifully coloured, and move very slowly. I have collected some specimens of *G. arcuata* Fabr. from Kalimpong, West Bengal. At first I was unable to discover the spider in the web but on careful